

**WHAT IS CLAIMED IS:**

1           1. A gear-reduction device for measuring and  
2     transmitting rotary and swivel movements, comprising a plurality  
3     of wheel/pinion pairs, each wheel/pinion pair having a gear  
4     axle, a gear wheel and a pinion gear, the gear wheel and the  
5     pinion gear being rigidly connected to the gear axle; said gear-  
6     reduction device being adapted to be coupled to a rotary object  
7     that moves in a plane of rotation and whose movement is to be  
8     measured within a measuring range; and said gear-reduction  
9     device producing an output motion that is reduced in relation to  
10    the movement of the rotary object, thereby expanding the  
11    measuring range; wherein

12           the gear wheels of the different wheel/pinion pairs lie  
13    in different gear-wheel planes, at least a part of the gear-  
14    wheel planes being parallel to each other and inclined in  
15    relation to the plane of rotation of the rotary object;

16           the gear wheels of the different wheel/pinion pairs are  
17    of equal diameter;

18           the wheel/pinion pairs follow each other in a sequence  
19    where the pinion gear of each wheel/pinion pair is engaged in  
20    the gear wheel of the next following wheel/pinion pair;

21           the gear wheel of the first wheel/pinion pair in the  
22    sequence is the input wheel, being positively engaged and driven  
23    by the rotary object; and

24           the gear wheel of the last wheel/pinion pair in the  
25           sequence is the output wheel, the pinion of the last  
26           wheel/pinion pair being adapted to positively engage and drive  
27           an optical angle-measuring device adapted for rotary swivel  
28           motion in a swivel-motion plane.

1           2. The gear-reduction device of claim 1, wherein the  
2           gear-wheel plane of the input wheel is parallel to the plane of  
3           rotation of the rotary object.

1           3. The gear-reduction device of claim 1, wherein the  
2           gear-wheel plane of the output wheel is parallel to the swivel-  
3           motion plane of the optical angle-measuring device.

1           4. The gear-reduction device of claim 1, wherein all  
2           gear-wheel planes are parallel to each other and inclined at an  
3           oblique angle in relation to the plane of rotation of the rotary  
4           object.

1           5. The gear-reduction device of claim 1, wherein the  
2           input wheel has an input shaft and is kinematically coupled to a  
3           driving unit, and the output wheel has a central output shaft  
4           adapted to transmit movement to a driven device.

1           6. The gear-reduction device of claim 5, further

2 comprising a base plate, a cover plate, and a plurality of  
3 rotary bearings mounted in the base plate and the cover plate,  
4 wherein at least the input shaft and the central output shaft  
5 run in the rotary bearings and wherein further the gear-  
6 reduction device is adapted to be flange-mounted on the driving  
7 unit and to form a unitary module with the driving unit.